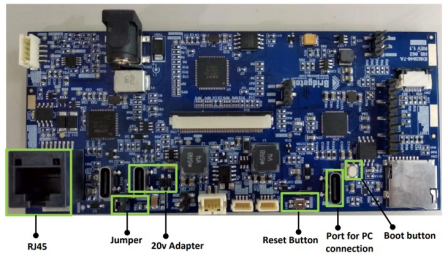


BRT Sys AN-003 LDSBus Python SDK User Guide

Application Note
BRTSYS_AN_003
LDSBus Python SDK on IDM2040 User Guide
Version 1.2
Issue Date: 22-09-2023

Contents

AN-003 LDSBus Python SDK

This document provides information about how to setup and use the LDSBus Python SDK on IDM2040.
Use of BRTSys devices in life support and/or safety applications is entirely at the user's risk, and the user agrees to defend, indemnify, and hold BRTSys harmless from any and all damages, claims, suits, or expense resulting from such use.

Introduction

This document describes how to use IDM2040 with LDSU circuity example including the Installation procedure for Thorny Python IDE and steps to execute LDSU circuitry examples.
The Python SDK will run on IDM2040 with appropriate LDSBus interface. IDM2040 has built-in LDSBus interface and can supply up to 24v to the LDSBus. More information on the IDM2040 is available at **https://brtsys.com**.

Credits

Open-Source Software

- Thorny Python IDE: **https://thonny.org**

Getting Started with IDM2040

3.1 Hardware Overview

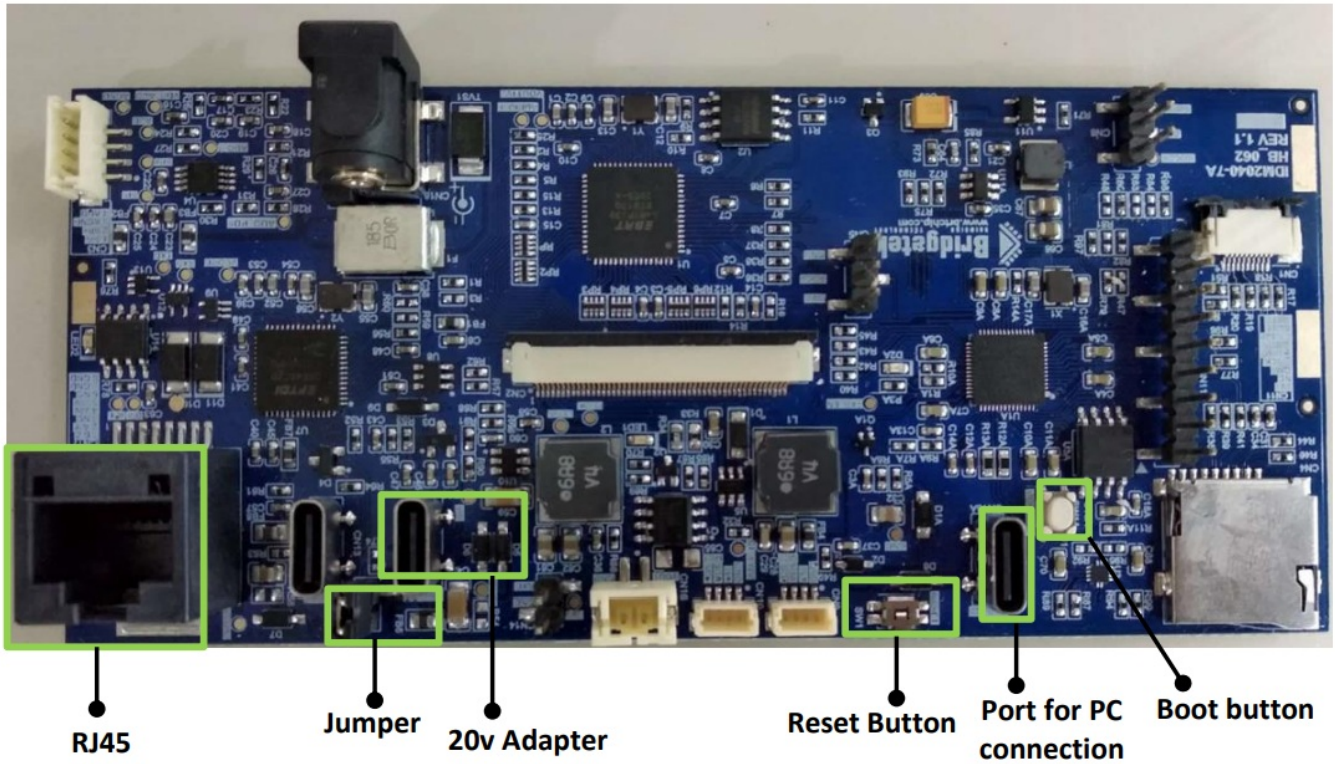
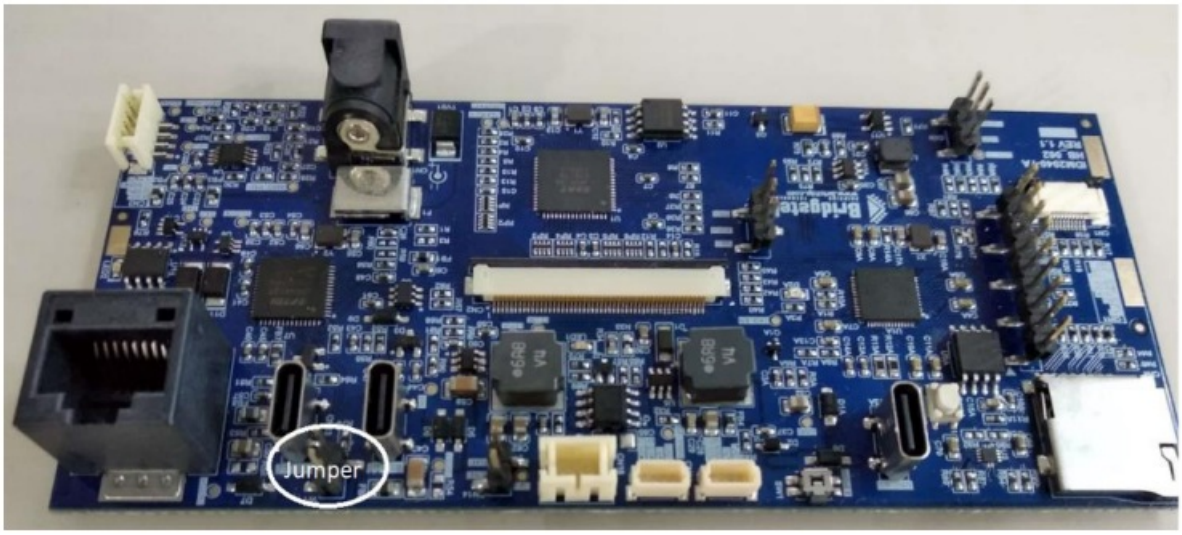


Figure 1 - IDM2040 Hardware Features

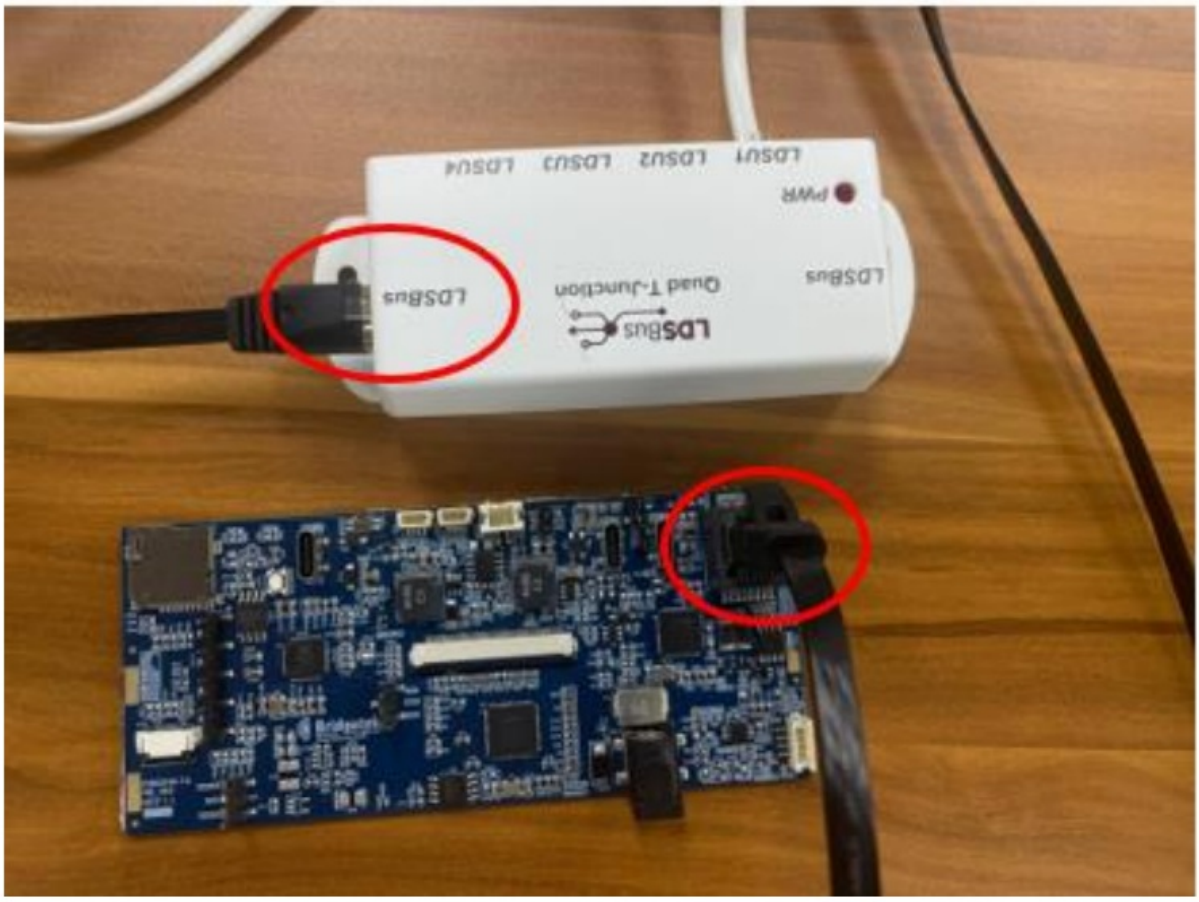
3.2 Hardware Setup Instructions

Follow these steps to setup the IDM2040 Hardware Setup –
a. Remove the Jumper.



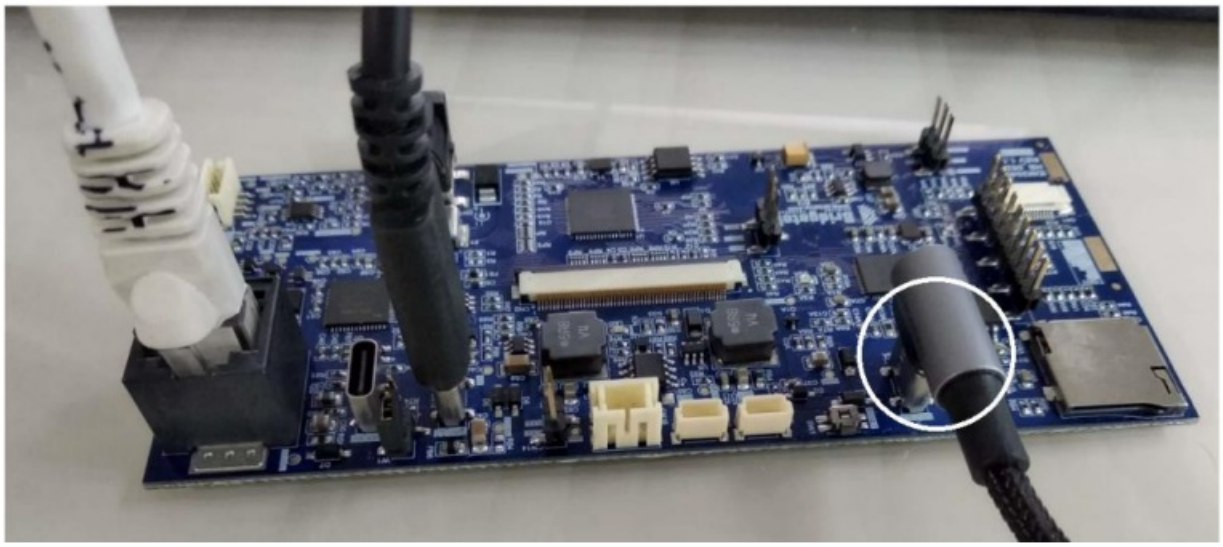
b. Connect the LDSU module to Quad T-Junction.

c. Using RJ45 cable, connect Quad T-Junction to IDM2040 RJ45 connector.

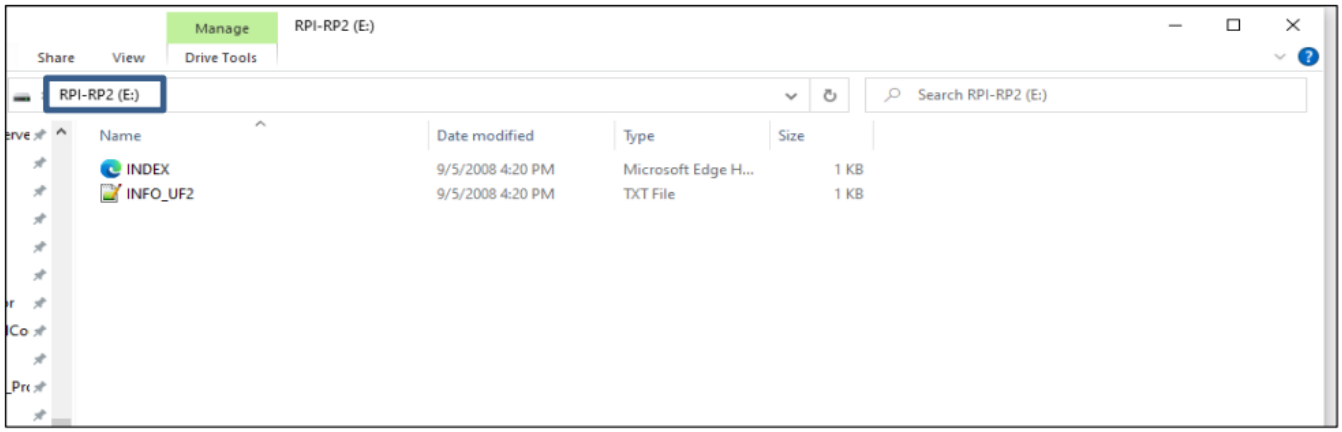


d. Connect the 20v supply adapter using a USB-C cable to the USB-C port on the IDM2040.

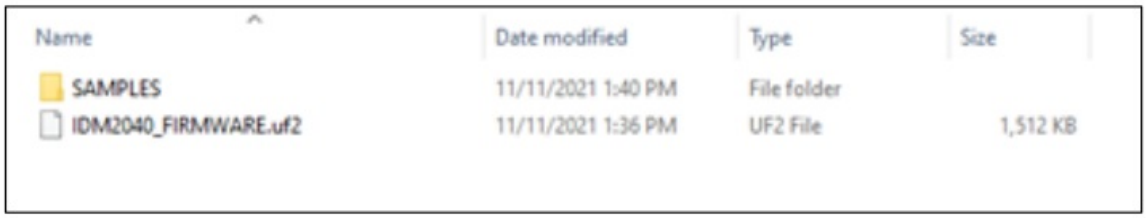
e. Turn on the 20v adapter using the AC power supply.
f. Connect IDM2040 to PC using Type-C cable.



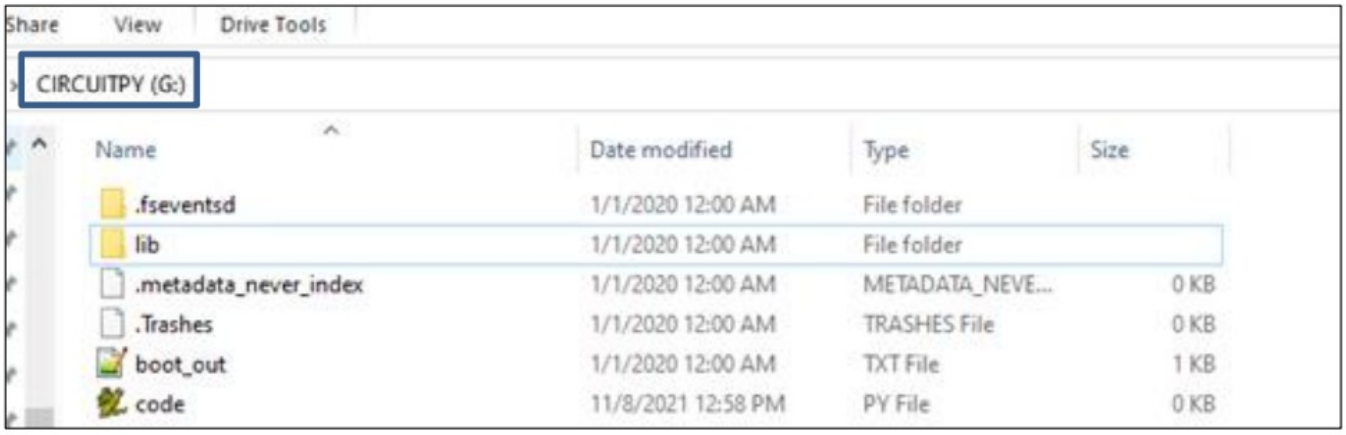
g. Press the Boot button the IDM2040 board; Hold it for a few seconds and release it after resetting the board. Windows will open a drive named “RP1-RP2”.



h. In the given example package, there must be an “.uf2” file, copy the file and paste it into “RP1-RP2” drive.

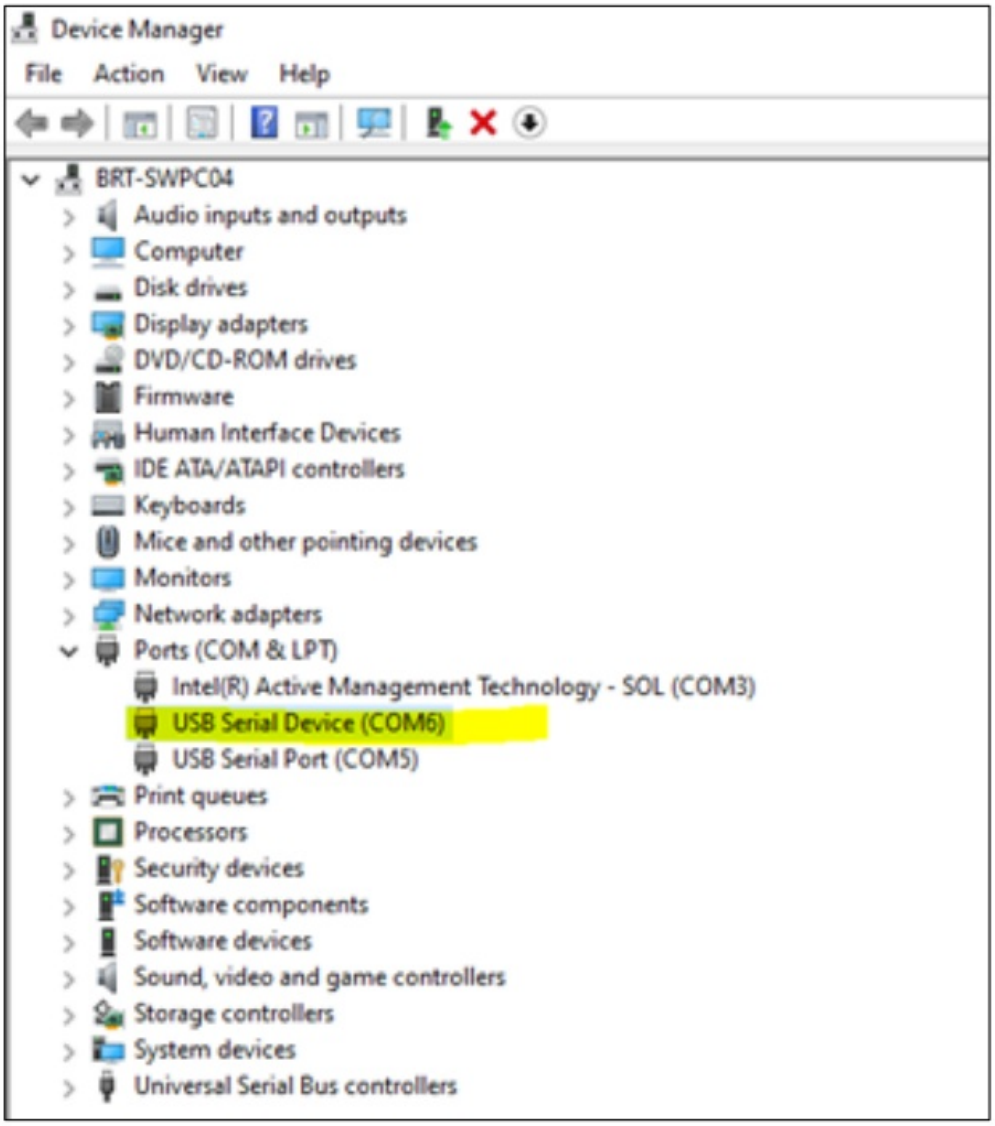


i. Upon copying the “.uf2” file to “RPI-RP2”, the device will reboot automatically and again will appear as a new drive, such as “CIRCUITPY”.



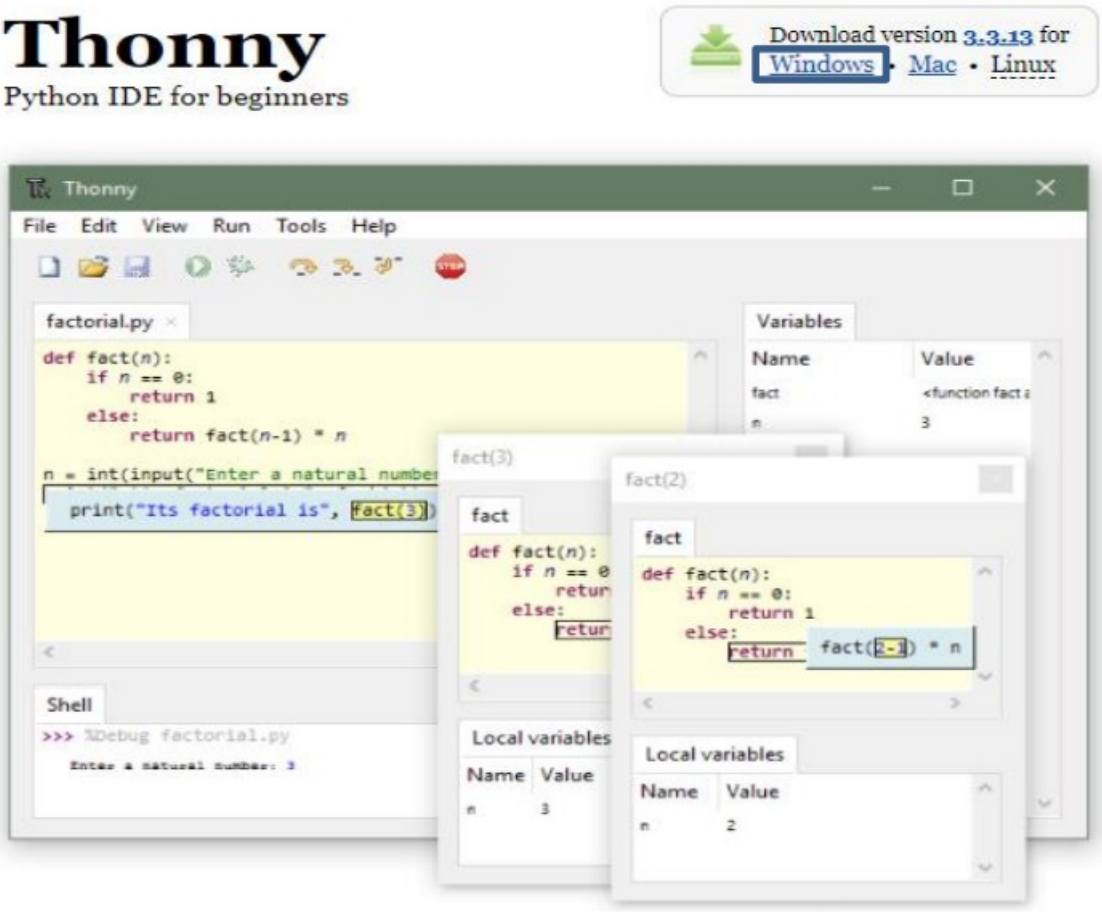
The “code.py” is the main file which runs every time the IDM2040 is reset. Open this file and delete any content inside of it before saving.

j. The COM port for this device will appear in Device Manager. Here is an example screen showing the IDM2040’s COM Port as COM6.

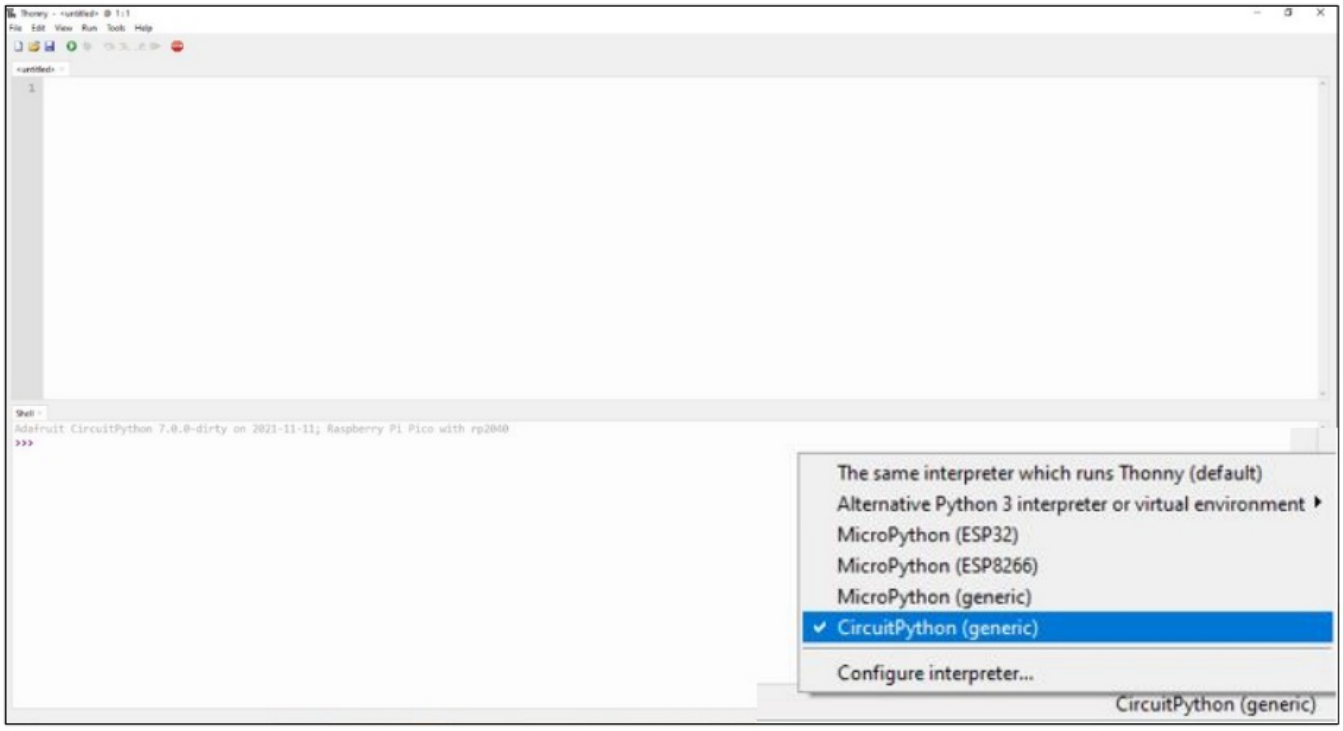


Thorny Python IDE – Installation/Setup Instructions

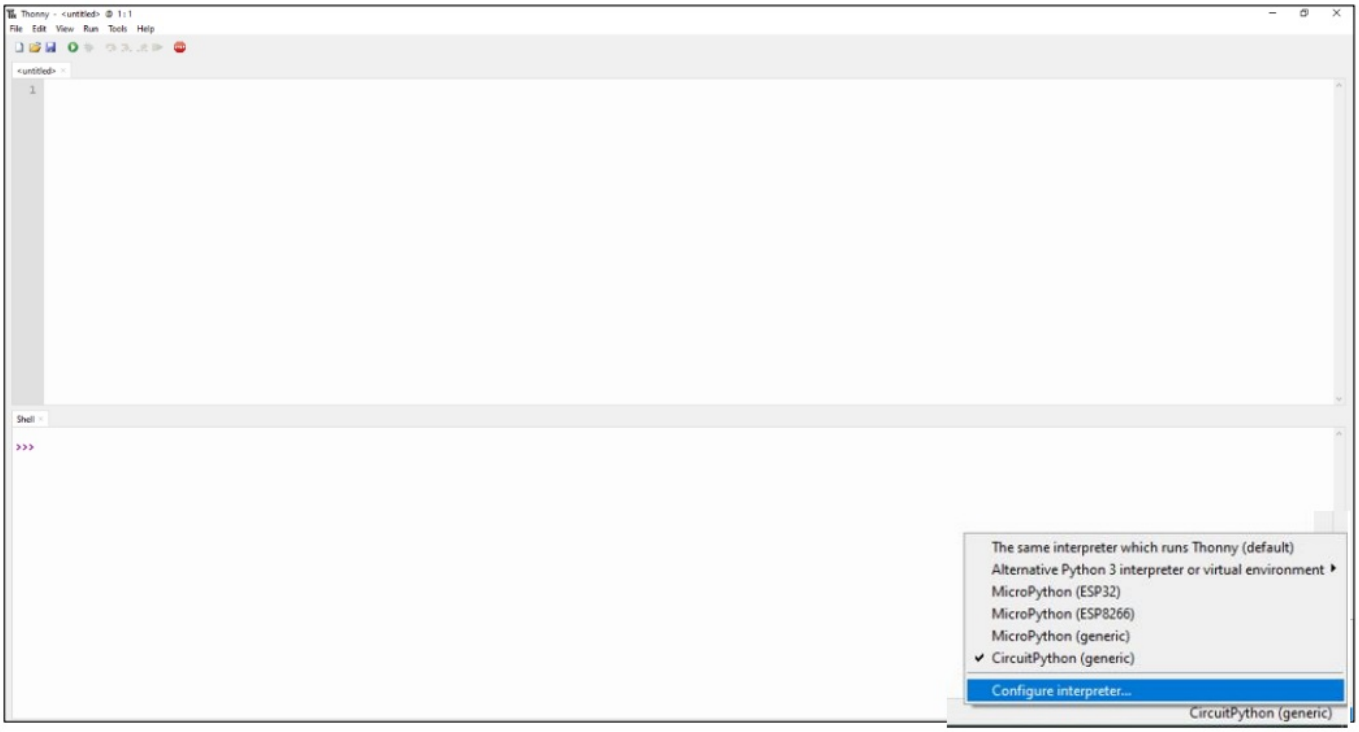
Follow these steps to install and setup Thorny Python IDE –
a. Download the Thorny Python IDE package from **https://thonny.org/**.
b. Click **Windows** to download the windows version.



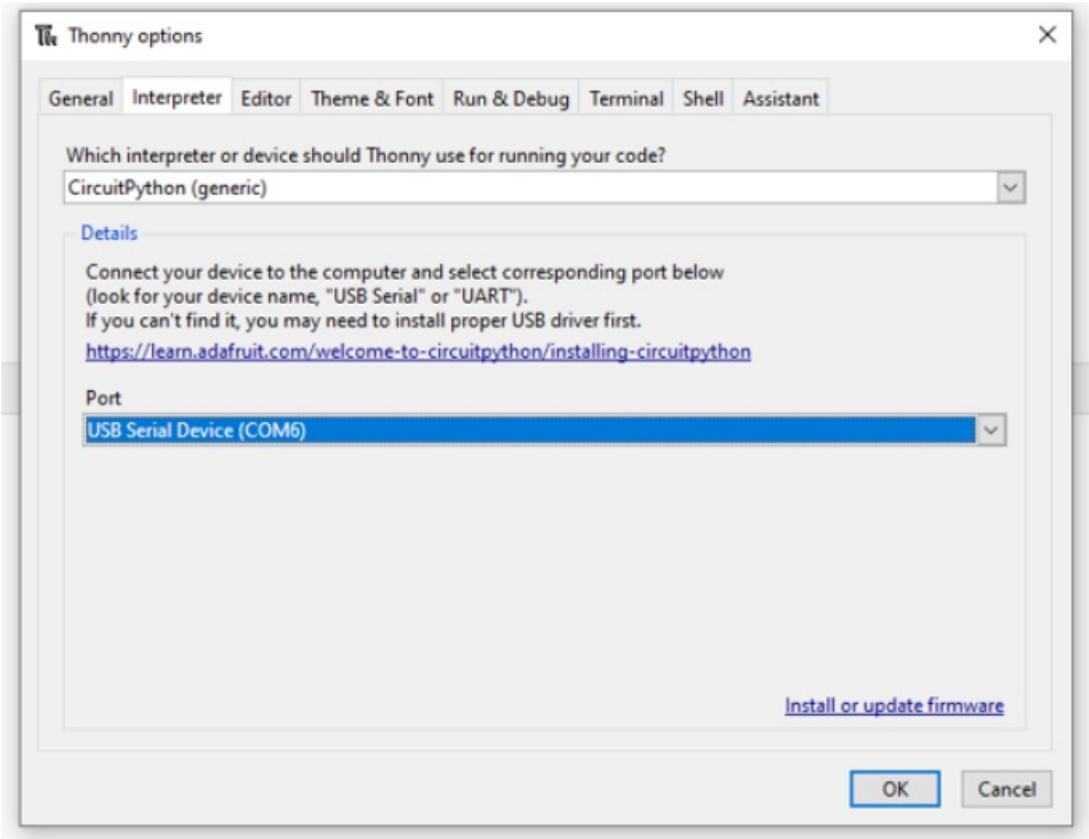
c. Upon downloading the application, complete the installation by clicking the executable file (.exe) and following the installation wizard. Upon completing the installation, open the Thorny Python IDE from the Windows Startup.
d. To open the Properties, click the left mouse button at the right bottom corner. Select “Circuit Python (generic)”.



e. Click “**Configure Interpreter…”.**



f. Click on the Port drop down and select the port appeared for IDM2040 in device manager after connecting. In this example screenshot COM port appeared as COM6. Click **[OK].**

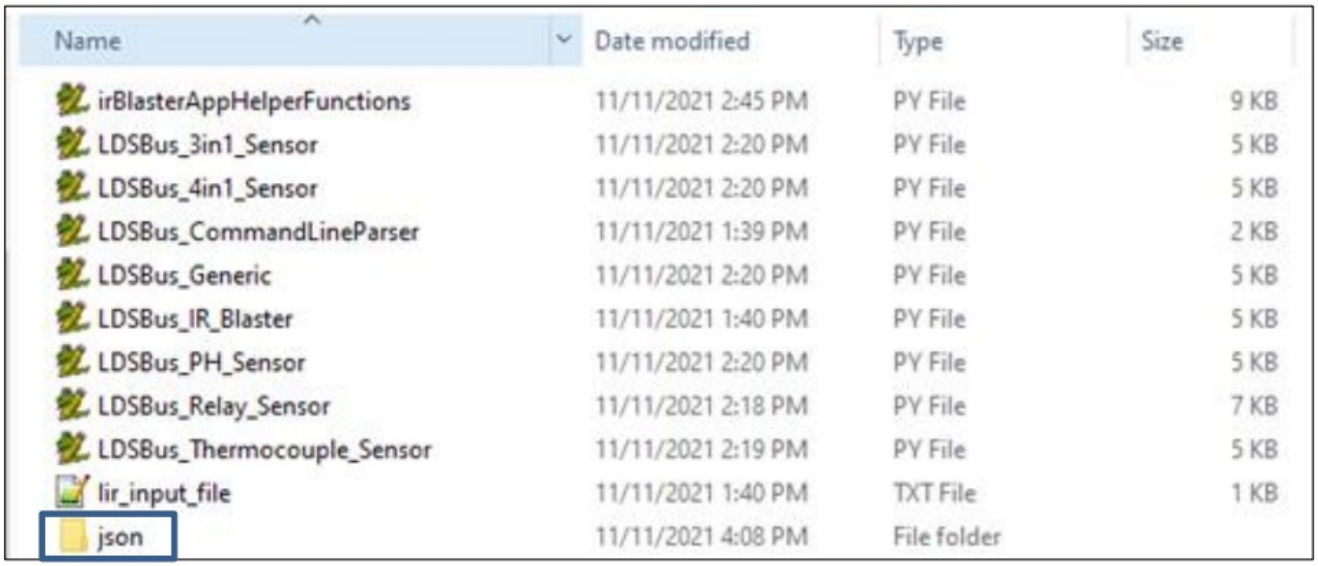


g. Thorny will report the device information at the interpreter prompt (“Ad fruit Circuit Python 7.0.0-dirty on 2021-11-11; Raspberry Pi Pico with rp2040”) if the device port is correct.

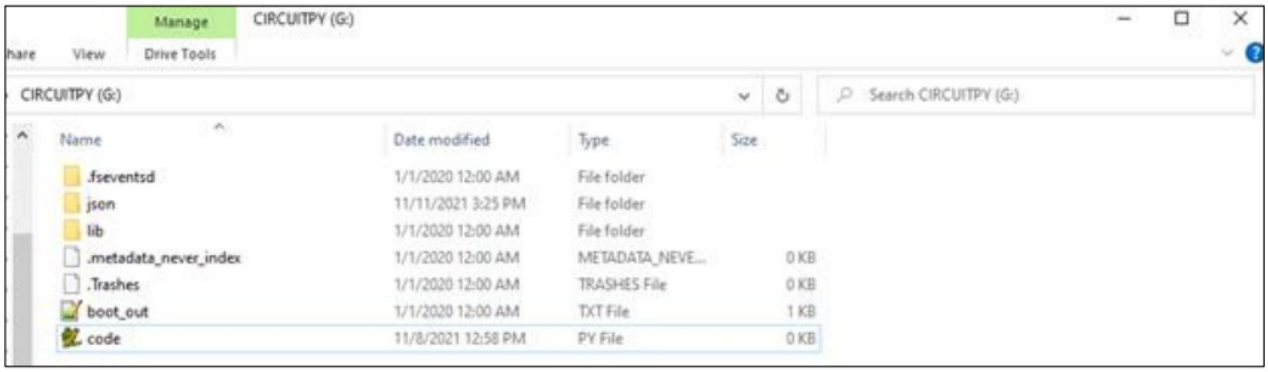
```
Adafruit CircuitPython 7.0.0-dirty on 2021-11-11; Raspberry Pi Pico with rp2040
>>>
```

Procedure to run LDSU Circuity Sample Example using Thorny

Follow these steps to run the LDSU circuity sample example –
a. Open the sample package file. As part of the sample package there is a folder by name “son” which contains various sensor son file.

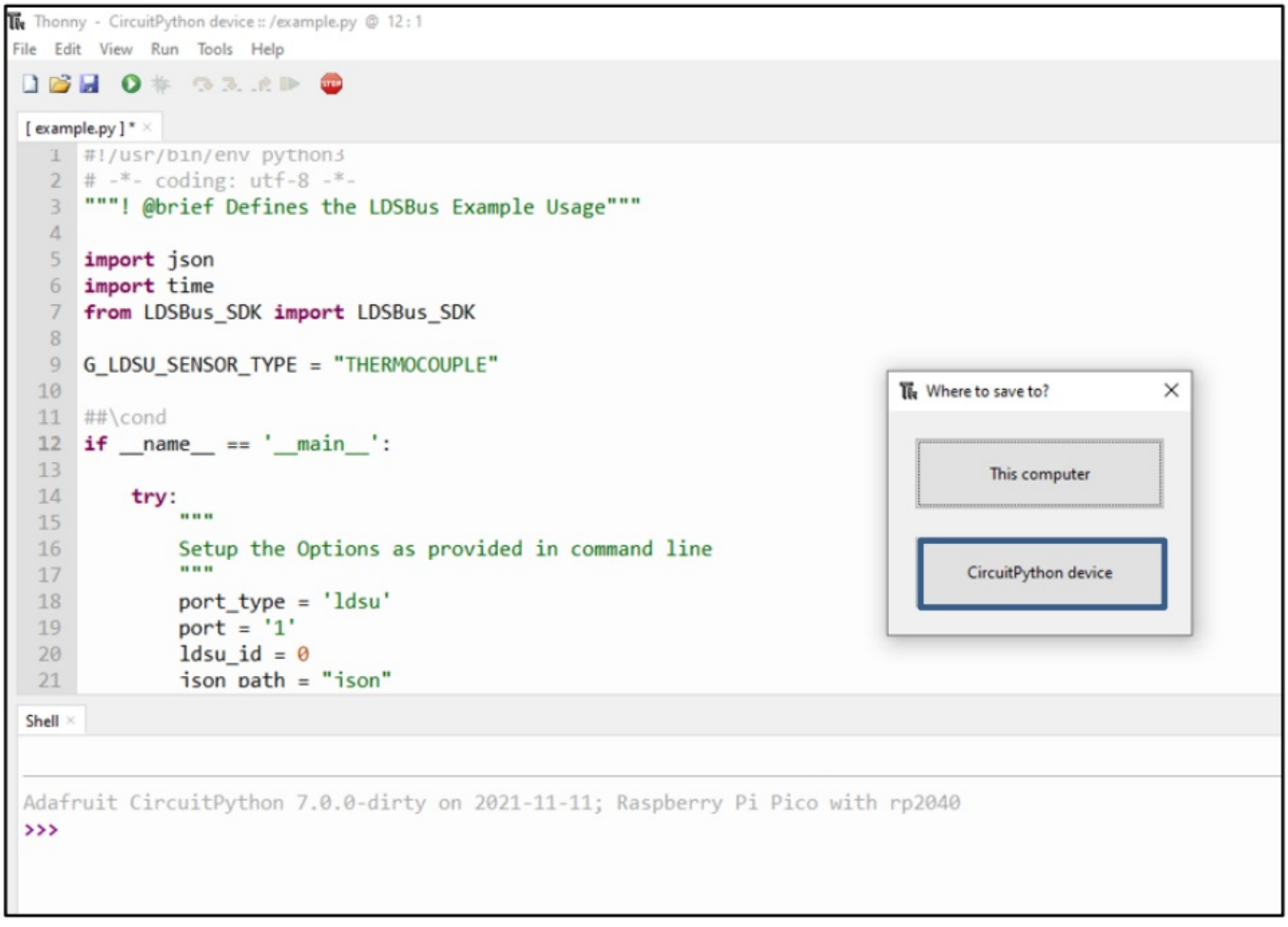


b. Copy and paste the “json” folder to the “CIRCUITPY” storage device.



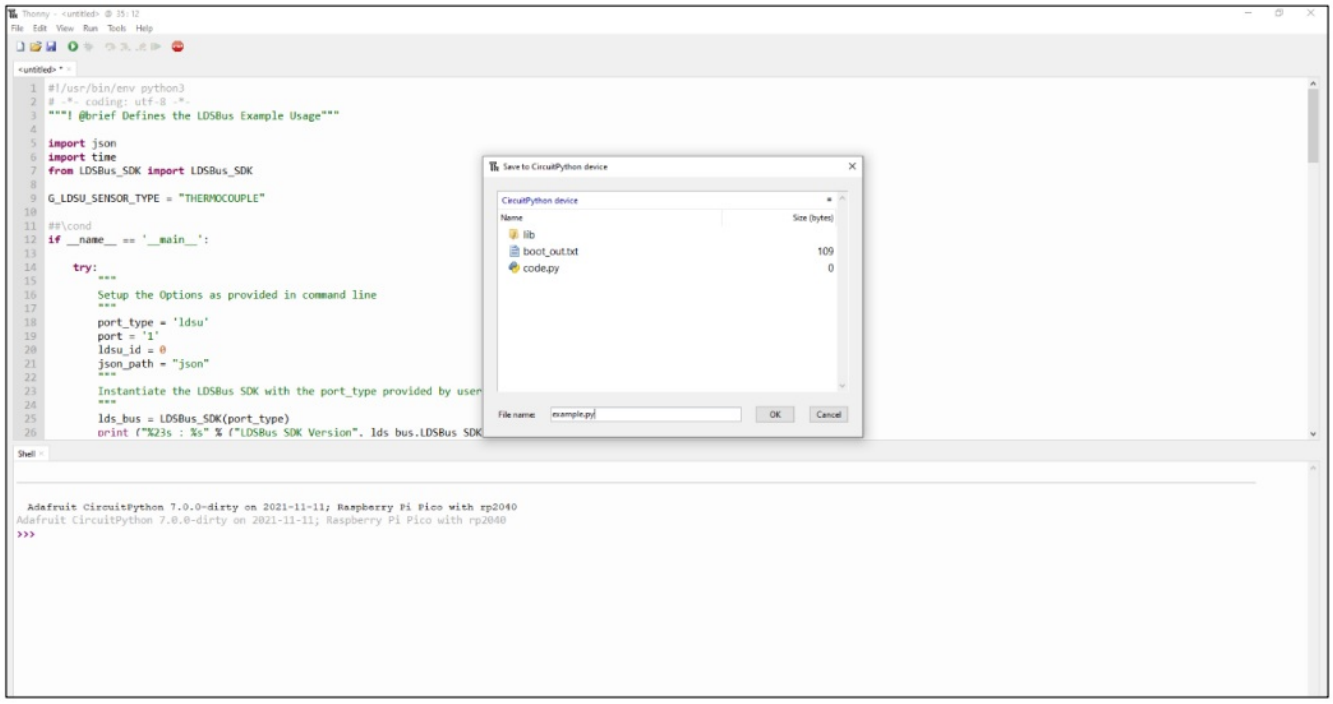
c. Open any given example using a text editor such as notepad ++ and copy it to the Thorny Editor and save it. For example, open “LDSBus_Thermocouple_Sensor.py” and copy/paste on Thorny Editor. Click **[Save].**

d. Upon clicking [Save], a “Where to save to?” dialog box will be displayed. Click and select Circuit Python device.

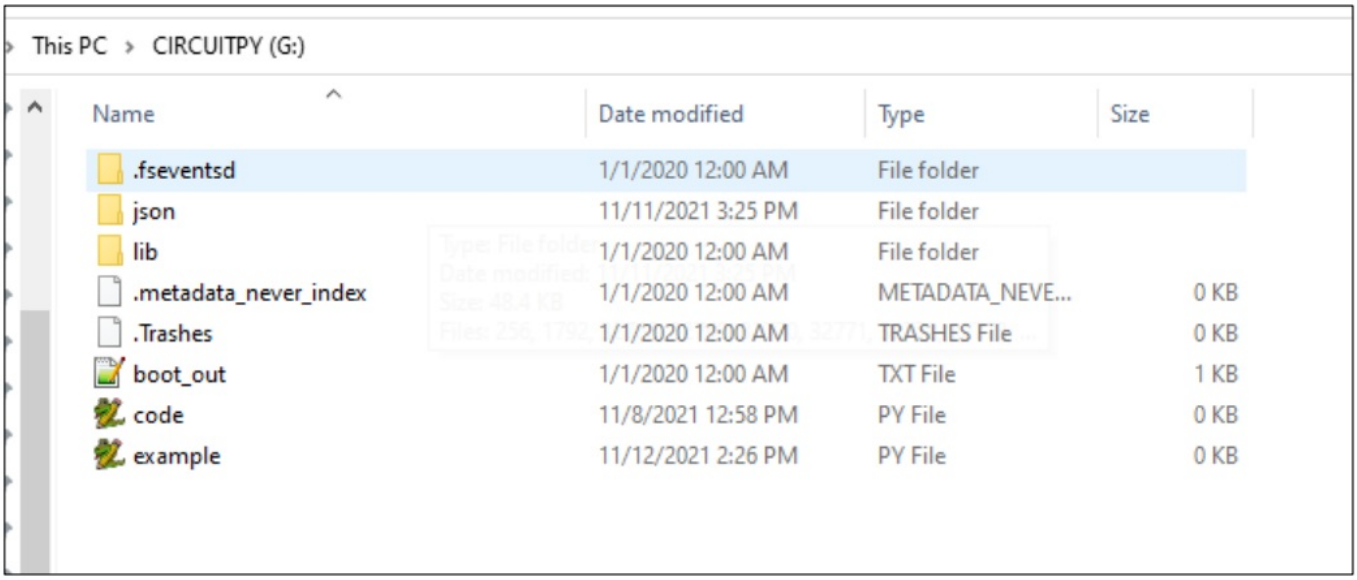


e. Enter a file name and click [OK].

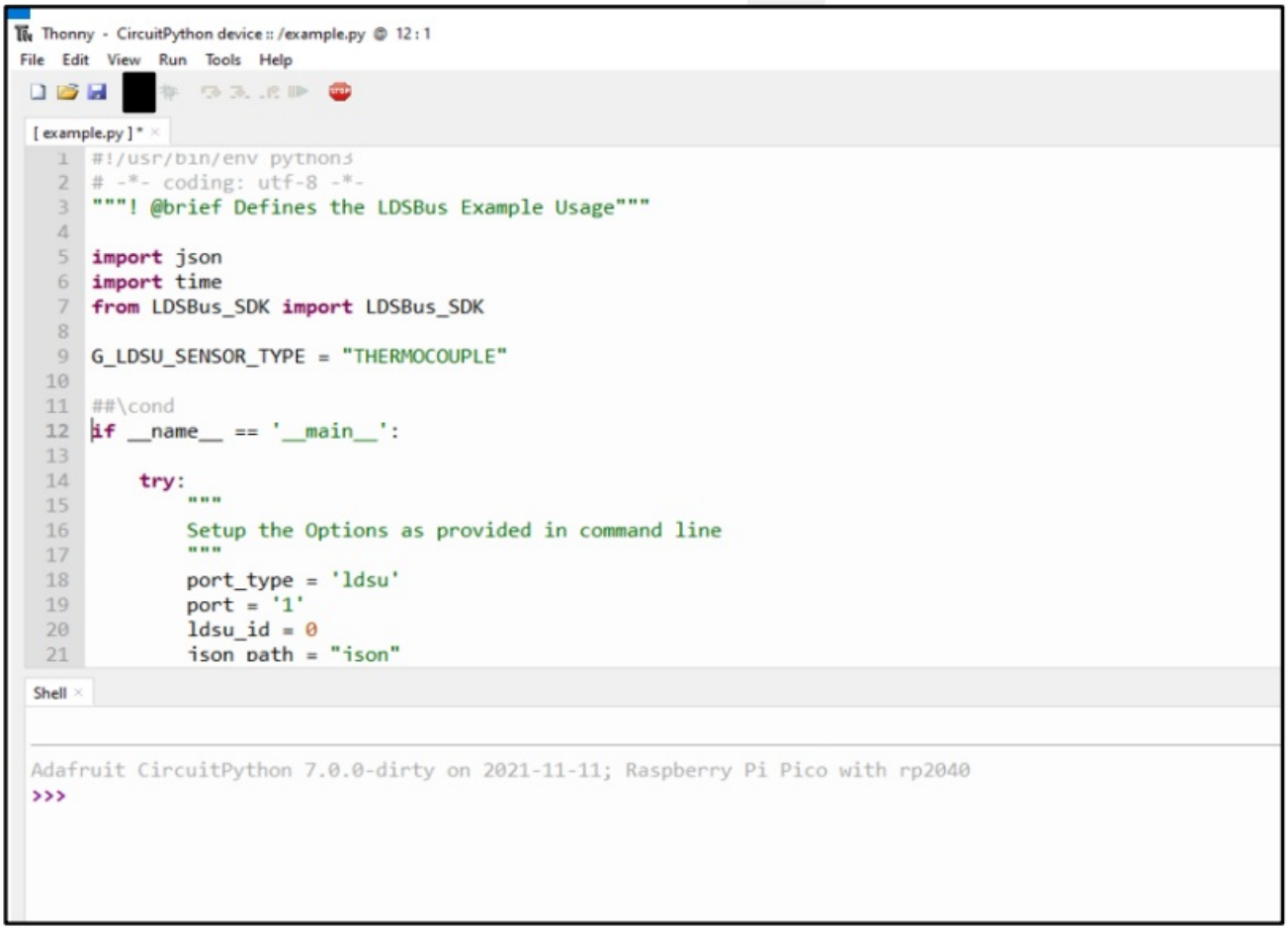
Note: When sample code is saved to “code.py” then every time it reboots, it will begin running “code.py”. To avoid this, specify a different name.



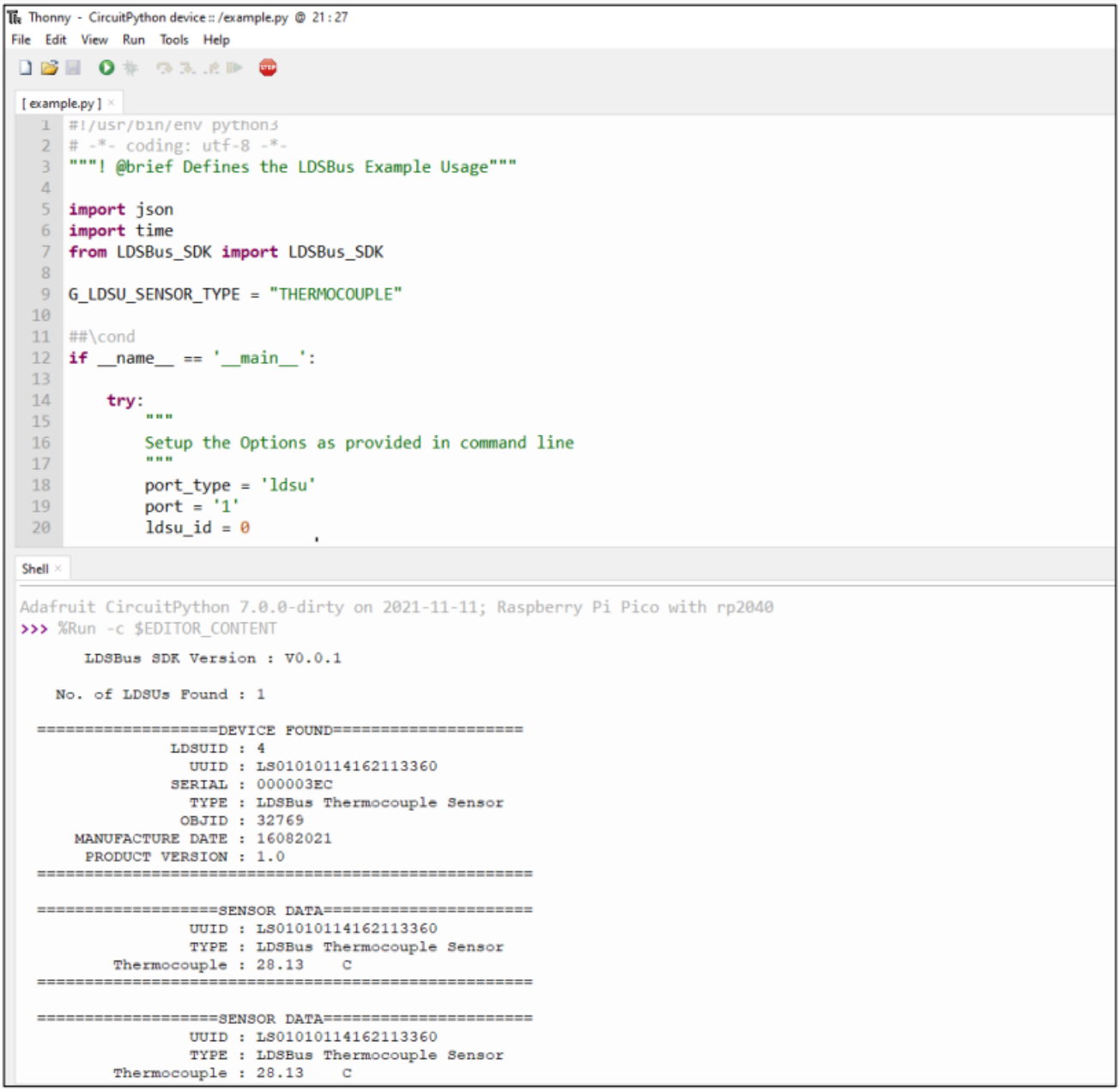
f. The file will be saved to “CIRCUITPY” drive.



g. To run the example from Thorny Editor, click  (Run current script).



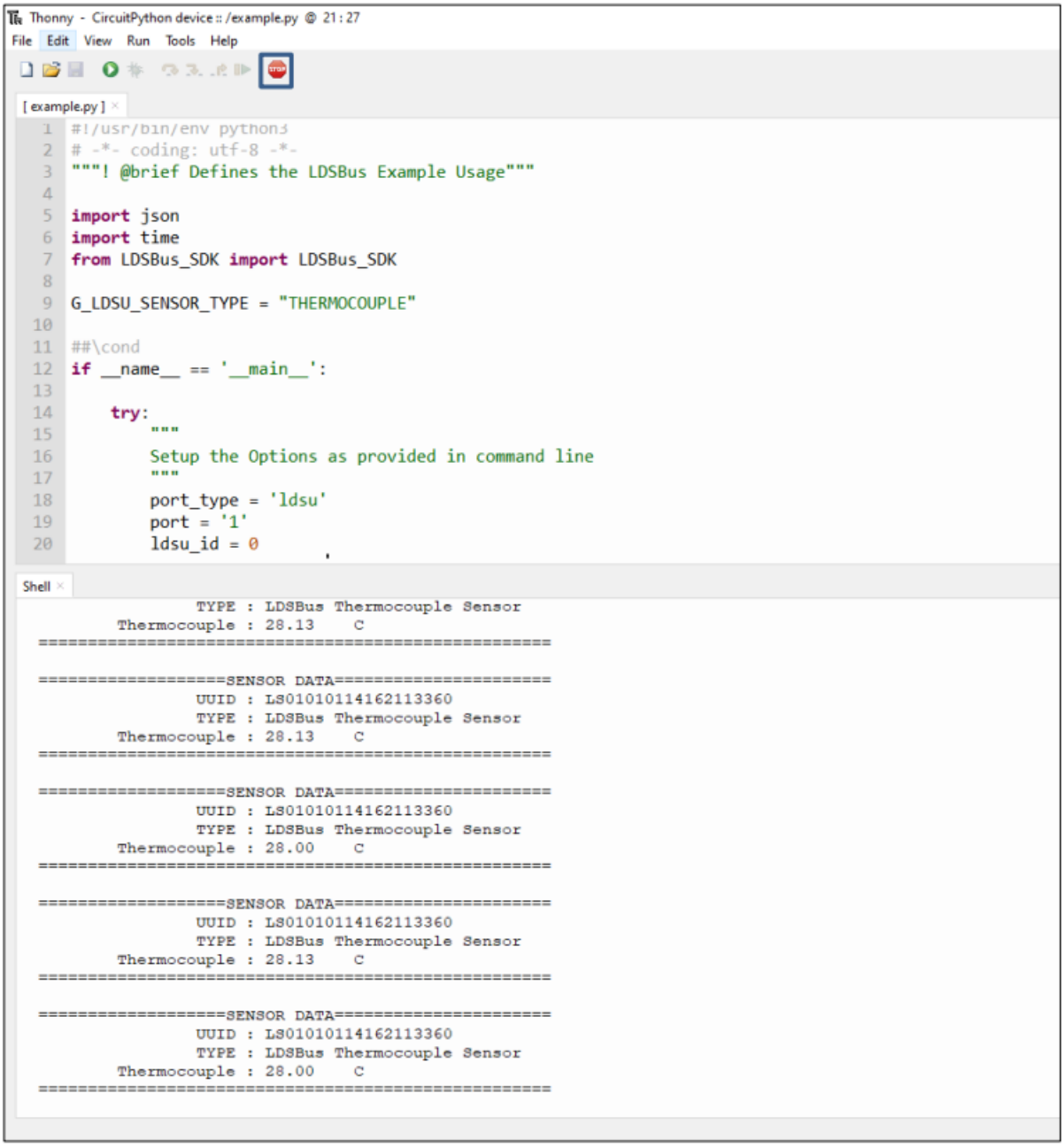
h. The Circuity LDSU example will run to scan the bus and start reporting the sensor data.



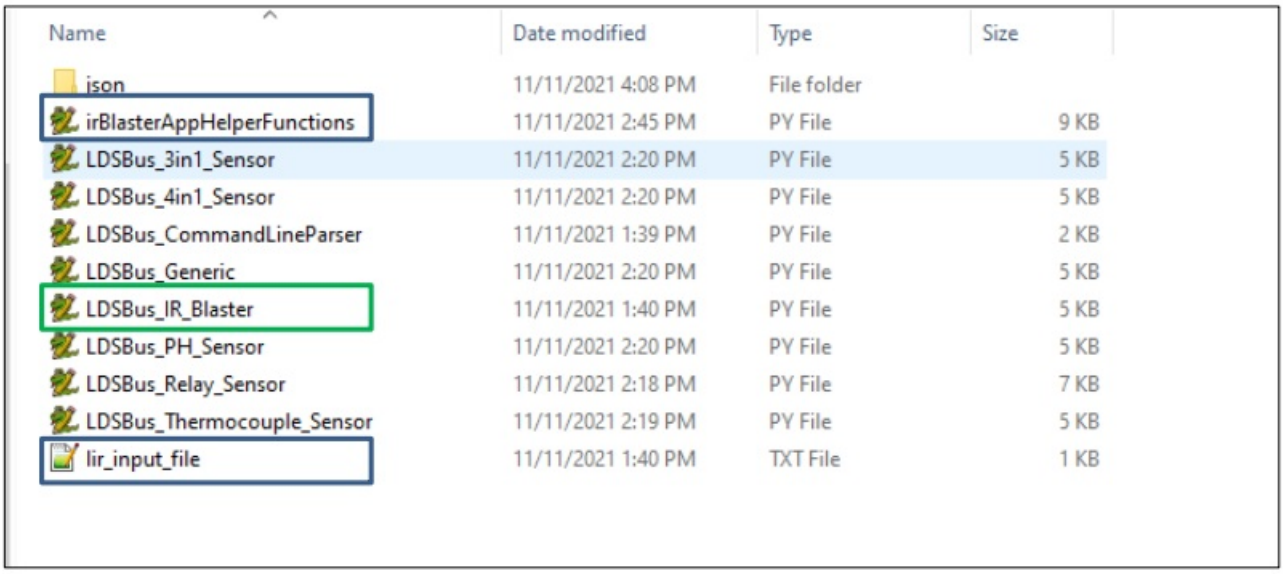
i. To stop the execution, click 

(Stop). Users can update the code as required or can copy/paste another example to try in the Thorny editor.

Note: Upon making any changes to the script file, remember to Save and Run the script.



j. Remember to copy the following files – “irBlasterAppHelperFunctions” and “lir_input_file.txt” before trying the LDSBus_IR_Blaster.py example.



Refer to **BRTSYS_AN_002_LDSU IR Blaster Application** for more details on “LDSBus_IR_Blaster.py” example.

Contact Information

Refer to **https://brtsys.com/contact-us/** for contact information.

Appendix A – References

Document References

BRTSYS_API_001_LDSBus_Python_SDK_Guide
BRTSYS_AN_002_LDSU IR Blaster Application

Acronyms and Abbreviations

Terms	Description
IDE	Integrated Development Environment
LDSBus	Long Distance Sensor Bus
USB	Universal Serial Bus

Appendix B – List of Tables & Figures

List of Tables

NA

List of Figures

Appendix C – Revision History

Document Title: BRTSYS_AN_003 LDSBus Python SDK on IDM2040 User Guide
Document Reference No.: BRTSYS_000016
Clearance No.: BRTSYS#019
Product Page: **https://brtsys.com/ldsbus**
Document Feedback: **Send Feedback**

Revision	Changes	Date
Version 1.0	Initial Release	29-11-2021
Version 1.1	Updated release under BRT Systems	15-09-2022
Version 1.2	Updated HVT references to Quad T-Junction; Updated Singapore Address	22-09-2023

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Documents / Resources

	BRT Sys AN-003 LDSBus Python SDK [pdf] User Guide AN-003, AN-003 LDSBus Python SDK, LDSBus Python SDK, Python SDK, SDK